Brandon Leung

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EDUCATION

University of California, San Diego (UCSD)   **Sep. 2015 – Dec. 2021 (Expected)**
- M.S. in Machine Learning & Data Science, expected graduation December 2021. GPA 3.86.
- B.Sc. in Computer Science, graduated August 2019. GPA 3.88 (Magna Cum Laude).

SIGNIFICANT PROJECTS

Drone Flight Dataset for Neural Network Vision Assessment (Jun. 2017 – Present)
- Project leader and main developer of a novel drone flight system, recruiting 12 to collect a 120,000 image dataset.
- Conducted experiments showing severe AlexNet/ResNet/VGG vulnerabilities (30% drop) to pose & camera shake.

Improving 3D Reconstructions with Self-Supervised Machine Learning (Sep. 2019 – Present)
- Developed a novel neural network refinement algorithm to generate 3D meshes from a single image.
- Exploited self-supervised learning to beat state-of-the-art results by up to 47%, across many metrics and datasets.

Self-Driving Cars using 2D/3D Action and Explanation Prediction (Feb. 2021 – Present)
- Helped formulate and develop a model fusing 2D images & 3D pointclouds for self-driving car action prediction.
- 2D & 3D explanations from Faster R-CNN & MVX-Net are jointly predicted with actions, justifying model decisions.
- Utilized the Waymo Open dataset, with new action & explanation annotations labeled using Amazon Turk.

Statistical Linguistic Analysis for User Chat Message Logs (Feb. 2021 – Jul. 2021)
- Built an interactive dashboard to analyze user chat logs and describe their linguistic behavior.
- Leveraged modern NLP to provide sentiment analysis, clustering, and generative modeling capabilities.
- Tested with pytest and documented with Sphinx. Deployed using AWS EC2 and S3.

PUBLICATIONS

- **Catastrophic Child's Play: Easy to Perform, Hard to Defend Adversarial Attacks [link]**   **Published, CVPR 19**
  Brandon Leung, Chih-Hui Ho, Erik Sandstrom, Yen Chang, and Nuno Vasconcelos
- **Black-Box Test-Time Shape REFINEment for Single View 3D Reconstruction** [link]   **MS Thesis, 2022**
  Brandon Leung
- **Explainable 3D Object-Induced Action Decisions for Autonomous Vehicles**   **In submission, CVPR 22**
  Arth Dharaskar, Allen Cheung, Brandon Leung, Chih-Hui Ho, and Nuno Vasconcelos

PROFESSIONAL EXPERIENCE

Graduate Student Researcher   **Statistical Visual Computing Lab, UCSD**   **Jun. 2017 - Now**
- Researching deep learning based computer vision under Prof. Nuno Vasconcelos, with a focus in 2D/3D detection, domain adaptation, GANs, 3D reconstruction, self-supervised learning, and explainable neural networks.

Software Engineer, Intern   **Himax Imaging**   **Summers 2015 & 2016**
- Developed internal quality control programs in Java for a R&D/fabrication company specializing in CMOS image sensors used in smartphone cameras and car backup cameras.

ADDITIONAL EXPERIENCE AND AWARDS

- **NSF Graduate Research Fellowship (Apr. 2020)**
- **Sloan Foundation Graduate Research Fellowship (Sep. 2019)**
- **Teaching Assistant, UCSD Computer Science Department (Jan. 2018 – Jan. 2019)** Helped design curriculum, held review sessions, and graded assignments/exams for data & computer science courses (DSC 40A/B, CSE 8A).
- **Data Science Research Mentor (2018 – 2021)** Mentored undergrads for UCSD's Summer Research Program (SRIP).
- **Conference Reviewer (ECCV 2020, ICCV 2021, CVPR 2021)**
- **IT Technician, UCSD (2016 – 2017)** Gave networking, software, and hardware support for UCSD's students & staff.

LANGUAGES AND TECHNOLOGIES

- **Expertise in:** Python, PyTorch, Jupyter Notebooks, OpenCV, Numpy, Plotly, Bash, Docker, pytest, Sphinx
- **Experience with:** Java, C, HTML/CSS, JavaScript, AWS, Matlab